U.S. Army Research, Development and Engineering Command

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MATREX Run Time Interface (RTI)

DoD M&S Conference

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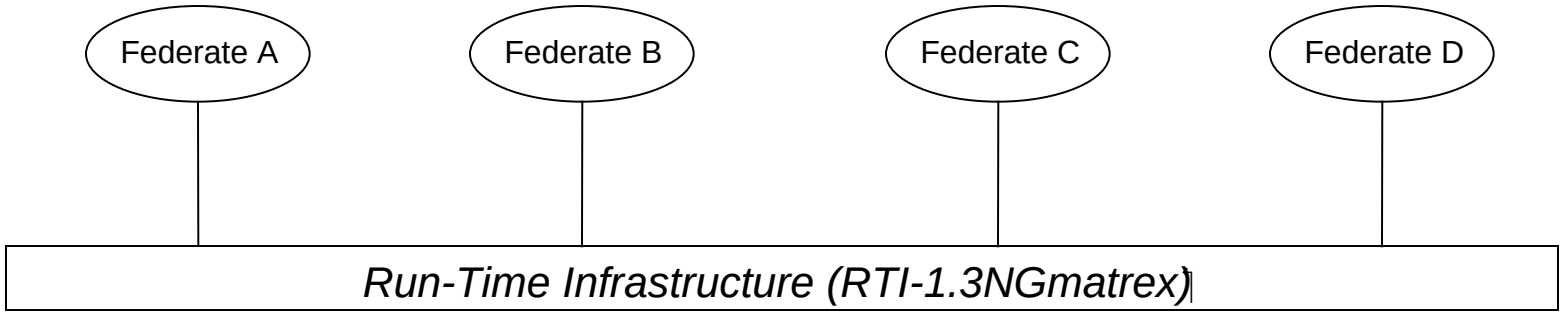
Overview

- High Level Architecture (HLA) is an architecture for supporting reuse and interoperability for distributed Modeling and Simulation. Two existing specifications:
  - DoD HLA 1.3
  - IEEE 1516 HLA
  - Coming soon: IEEE 1516 Evolved HLA
- Run-Time Infrastructure (RTI) is the software execution component of HLA. The RTI software provides a set of services used by federates to coordinate their operations and data exchange during a runtime execution.

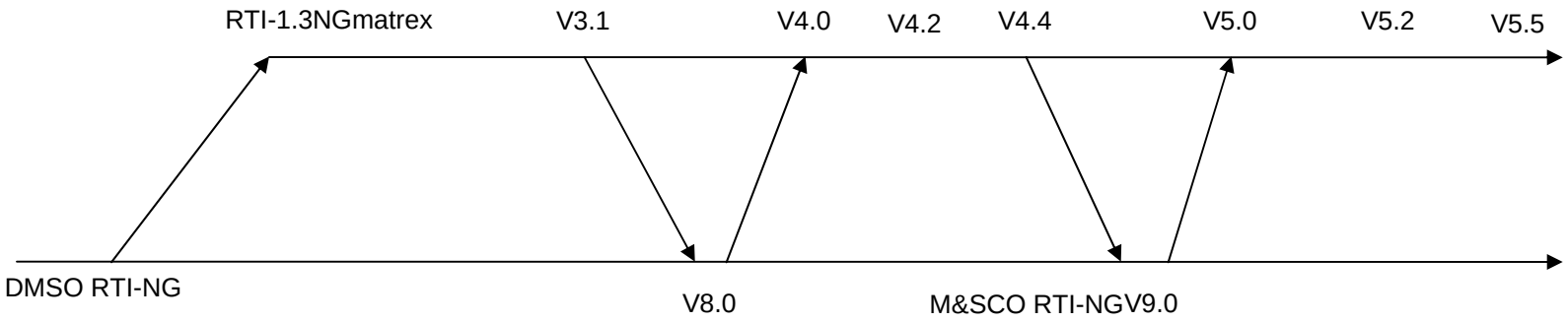


Benefits Overview

- Can communicate to other computer simulations regardless of the computing platforms.
- No Licensing required, just a Program Level Distribution Agreement between DoD sponsors
- Basically cost free to DoD customers
- Highly intelligent and experienced RTI SW Developers
- Quick technical support and issue resolution via RTI mail reflector

Features and Capabilities

- MATREX provides an RTI implementation:
  - Implements the DoD HLA 1.3 Interface Specification
  - Verified as compliant with the specification by the DoD
- Based on latest M&SCO (Modeling and Simulation Coordination Office) source code release: RTI-NG v9.0
  - MATREX v4.X changes submitted to M&SCO and merged with other source changes; this became v9.0
  - v9.0 used as baseline for RTI-1.3NGmatrexV5.X development



Features and Capabilities (cont.)

- Added automatic removal of dead federates
- Improved Interconnect Manager which manages inter-federate connections. Improved fault tolerance and reliability
- Simplified Data Distribution Management (DDM) configuration and improved performance in federations with DDM and non-DDM capable federates
- Reduced latency when using message bundling
- Improved distributor threading and queuing model for supporting wide area exercises
- Added customized DDM strategy for FCS
- Upgraded ACE/TAO
- Completed various bug fixes
- Latest version is v5.5

Future Work

- Simplify configuration for use on hosts with multiple network cards and across wide area networks.
- Improve the detection of dead federates for automatic removal.
- Add ability for distributor to be configured to drop certain types of packets when federates are slow.
- Re-baseline with M&SCO source code release
- Upgrade ACE/TAO

Customers

- RDECOM (RDEC's)
  - Aviation and Missile Research, Development and Engineering Center (AMRDEC)
  - Armament Research, Development and Engineering Center (ARDEC)
  - Army Research Laboratory (ARL)
  - Communications-Electronics Research, Development and Engineering Center (CERDEC - Belvoir/Monmouth)
  - Natick Soldier Research, Development and Engineering Center (NSRDEC)
  - Simulation & Training and Technology Center (STTC)
  - Tank and Automotive Research, Development and Engineering Center (TARDEC)
- FCS/LSI
- TRADOC
  - Battle Laboratory Collaborative Simulation Environment (BLCSE)
  - Mounted Maneuver Battlespace Lab (MMBL)
  - Product Manager Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance On-The-Move (PM C4ISR OTM) Testbed
- ATEC (OTC)
- 3CE
- Select PEO/PM's

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MATREX IDE Website: **https://www.matrex.rdecom.army.mil**

BACKUP

Compatibility

- All Versions of RTI-1.3NGmatrex are Dynamic Link Compatible
  - Do Not need to recompile existing federate applications
  - Do Not need to relink existing federate applications
  - Simply set environment to point to latest libraries and run

- RTI-1.3NGmatrex versions with different major version numbers aren't run time compatible
  - Cannot run applications using the v4.X libraries with applications using the v5.X libraries in the same federation
  - Can run applications using the v4.X libraries with applications using the v4.Y libraries
  - Can run applications using the v5.X libraries with applications using the v5.Y libraries

Build Types

- Windows 2k+/XP MSVC 8.0 – 32 bit
- Windows 2k+/XP MSVC 7.1 – 32 bit
- RedHat Enterprise 4 GCC 3.4.4 - 32 bit/64 bit
- Ubuntu 7.10 GCC 4.1 – 32 bit/64 bit
- Fedora Core 7 GCC 4.1 – 32 bit/64 bit
- Fedora Core 4 GCC 4.0 – 32 bit
- Fedora Core 3 GCC 3.2.2 – 32 bit
- RedHat 9.0 GCC 3.2.2 – 32 bit
- JAVA: JVM 1.4 and newer.
- Note: All 64 bit builds use the AMD x86_64 instruction set